

# SENSOR Occupational Lung Disease Bulletin

A project of the Massachusetts Department of Public Health's Occupational Health Surveillance Program, the Massachusetts Thoracic Society, and the Massachusetts Allergy Society

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Dear Health Care Provider,

The Occupational Health Surveillance Program (OHSP) is pleased to announce that we successfully competed for continued funding for surveillance of work-related asthma. In September, 2002, the National Institute for Occupational Safety and Health awarded OHSP funds for three more years. In addition to maintaining the system for collecting case reports of work-related asthma from health care providers, several new initiatives are planned. These include:

- using statewide emergency department data to identify cases of work-related asthma;
- conducting a pilot survey of workers in one industry; and
- working with a pharmacy and community health center to develop and disseminate patient materials on work-related asthma.

OHSP will continue to update you as we begin working on these projects.

Also as a new initiative, beginning in March 2003, we will offer the *Occupational Lung Disease Bulletin* in both print and electronic formats. If you (or any of your colleagues) would like to receive the *Bulletin* electronically please send an email to the address listed below. Specify whether you would like to receive the *Bulletin* in both formats or electronic only. We also welcome comments and suggestions about topics for future bulletins.

**Occupational.Asthma@state.ma.us**

This first issue of the *Bulletin* for 2003 provides highlights from recent news reports about work-related lung disease.

Sincerely,

Elise Pechter MPH, CIH

Occupational Asthma Surveillance Project

## Theatrical Fog and Work-Related Asthma in Performers

An opera singer sued the San Francisco Opera Association and three manufacturers due to work-related asthma caused by theatrical fog. The San Francisco Chronicle reported (12/15/02) that the singer accused the defendants of negligence and fraud. After 17 years of performing, with repeated exposures to the dramatic theatrical fog, she fell ill during a performance in 1999. Another opera singer with the San Francisco Opera Association, Pamela Dale, was diagnosed with reactive airways disease after falling ill in 1998. Dale was one of

three opera members who had filed workers' compensation claims. Both singers worry that their singing careers may be over.

Theatrical fogs are a deliberate form of air pollution affecting performers, stage workers, and orchestra members. Reported adverse effects include eye and throat irritation, increased incidence of respiratory infections, headaches, bronchitis, dizziness, and asthma.

Generating fine mists or actual smoke from the burning of organic materials creates the fogs and smokes. All smokes and fogs are easily inhaled, and most can be irritating to the lungs. Dry ice, fumed chlorides, mineral oils, glycol-based products, and burned organic materials are common products used to create fogs and smokes.

In 1994, NIOSH failed to find evidence that theatrical fogs caused occupational asthma. NIOSH released the results of two evaluations of theatrical smoke in several Broadway shows with no evidence that theatrical smoke or fog caused asthma in performers. NIOSH reported numerous complaints of asthma-like symptoms, and noted that some of the materials in smoke, including mineral oils and aerosolized glycols could irritate or dry mucous membranes.

The California Department of Health Services, acting on a complaint in 2000, surveyed opera employees working at the San Francisco Opera Association and reported unusually high levels of respiratory problems. Twenty-four percent reported symptoms triggered by theatrical fog, and 17% lost at least one day of work from allergic symptoms. The San Francisco Opera Association was cited and fined \$2,340.

## ACOEM Statement about Molds

The American College of Occupational and Environmental Medicine (ACOEM) released a new evidence-based statement about molds, October 27, 2002, entitled "Adverse

Human Health Effects Associated with Molds in the Indoor Environment." The statement discusses the state of scientific knowledge regarding fungal-related illnesses in relationship to the indoor environment. This article provides a brief summary of the statement.

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### Allergy

Molds are common and important allergens. It is estimated that 5% of individuals will have allergic airway symptoms, usually rhinitis or asthma, from molds over their lifetimes. Among the allergenic fungi, the most important are *Penicillium*, *Aspergillus*, *Cladosporium* and *Alternaria*. The most common form of hypersensitivity to molds is IgE-mediated immediate type hypersensitivity to fungal proteins (mold spores or hyphal fragments). Hypersensitivity pneumonitis, most commonly an occupational disease, results from exaggerated IgG immune response to inhaled large quantities of fungal or thermophilic Actinomyces (filamentous bacteria) proteins. Even less common are allergic bronchopulmonary aspergillosis (ABPA) and allergic fungal sinusitis (AFS) in which fungi actually grow within the patient's airway.

### Infection

Fungi are rarely significant pathogens for humans. Superficial fungal infections of the skin and nails are relatively common, but are readily treated and generally resolve without complications. Exceptions include deep tissue invasion in immunocompromised subjects and a limited number of pathogenic fungi (*Blastomyces*, *Coccidioides*, *Cryptococcus*, and *Histoplasma*), which normally do not grow indoors.

### Toxicity

Some molds that propagate indoors may, under some conditions, produce mycotoxins that can adversely affect people. *Stachybotras chartarum* is blamed for a diverse array of problems based on its capacity to produce mycotoxins. However, studies have failed to prove these. Current scientific evidence does not indicate that mycotoxins have adversely affected human health in home, school or office environments.

### Recommendations

Mold growth indoors should be prevented in machining fluids, in stored organic materials such as grain, and in residential, public and private buildings. When mold grows indoors there is an inappropriate supply of moisture that must be corrected before remediation of mold colonization can succeed. Mold growth should not be tolerated. It is likely to sensitize and produce allergic responses, destroy building materials, and produce offensive odors. To view the entire text, see <http://www.acoem.org/guidelines/article.asp?ID=52>

From 1992-2000, eight former workers of the Gilster-Mary Lee microwave popcorn plant in Jasper, Missouri developed a rare severe lung disease—bronchiolitis obliterans. Four were on lung transplant lists due to this fixed obstructive lung disease. Among the eight patients, four were mixers and four were packaging workers. Employment durations ranged from 8 months to 9 years.

The Missouri Department of Health and Senior Services requested assistance from the National Institute of Occupational Safety and Health (NIOSH) in evaluating the epidemiology of the disease and the current hazard. During 1992-2000, the popcorn plant employed about 560 workers; 425 no longer worked at the factory as of May 2000. NIOSH found the highest incidence of illness among the mixers, followed by the packagers. No cases were reported among other workers in the factory. NIOSH conducted a cross-sectional survey of 117 current workers. On the basis of national data adjusted for smoking and age, current workers had two to three times the expected rates of respiratory symptoms and self-reports of physician diagnoses of asthma or chronic bronchitis. The rate of obstruction on spirometry was over three times higher than expected.

NIOSH identified the airborne popcorn butter and oil flavoring as the exposure associated with the lung disease. They identified one ingredient, diacetyl—a ketone with butter-flavor characteristics—that could be measured to help link exposure to disease. Measured air concentrations were highest in the mixing room, lower in the microwave-packaging area, and “not detected” in the rest of the plant. Research conducted subsequent to the identification of these cases found that vapors from heated butter flavoring caused necrosis of the nasal and airway epithelium of rats.<sup>iii</sup>

<sup>i</sup> CDC, MMWR Fixed obstructive lung disease in workers at a microwave popcorn factory—Missouri, 2000—2002. CDC, MMWR April 26, 2002 51(16):345-7.

<sup>ii</sup> Parmet AJ, Von Essen S. Rapidly progressive, fixed airway obstructive disease in popcorn workers: a new occupational pulmonary illness? [Letter] JOEM March 2002 44(3):216-8.

<sup>iii</sup> Hubbs AF, Battelli LA, Goldsmith WT, Porter DW, Frazer D, Friend S, Schwegler-Berry D, Mercer RR, Reynolds JS, Grote A, Castranova V, Kullman G, Fredan JS, Dowdy J, Jones WG. Necrosis of nasal and airway epithelium in rats inhaling vapors of artificial butter flavoring. Toxicology and Applied Pharmacology December 1, 2002 185(2):128-35.

### Number of Work-Related Asthma Cases Reported to Massachusetts SENSOR, March 1992-November 2002

Sept 2002	October 2002	November 2002	Total to Date (3/92-11/02)
4	2	4	900

**Mail or fax the enclosed form to report new occupational lung disease cases.**

**Popcorn Butter Flavoring Caused Lung Disease<sup>iii</sup>**